

Laparoscopic Heller Myotomy for Achalasia: Changing Trend Toward “True” Day-Case Procedure

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Abstract

Background: Laparoscopic Heller myotomy is the most effective therapy for achalasia. All case series have reported a minimum length of stay of more than 1 day. “True” day-case laparoscopic Heller myotomy has not been reported, so far. The aim of this study was to review our results with laparoscopic Heller myotomy with respect to the length of stay following the procedure.

Methods: All patients undergoing laparoscopic Heller myotomy between August 2000 and July 2007 under the care of one surgeon were included in the study. This was performed by incising 6 cm of distal esophageal musculature, extending to 2 cm below the gastroesophageal junction. The myotomy was covered by an anterior fundoplication. All patients were reviewed in the clinic at a median of 6 weeks after surgery and, thereafter, if necessary.

Results: Over the 7-year period, 24 consecutive patients with achalasia were treated in this manner. There were 13 women and 11 men, with an age range of 12–73 years. Intraoperative complications included mucosal perforation in 2 patients (sutured immediately) with no postoperative complications or conversion to open surgery. There were no deaths. The average length of stay was 1.9 days (range, 0–4). The last 2 patients were discharged on the same day, and the 5 previous to this were discharged within 23 hours of surgery. There were no adverse outcomes related to early discharge, and there were no readmissions. All patients reported good to excellent results with a relief of dysphagia on follow-up. Three patients (12%) developed recurrent dysphagia after an initial improvement, requiring dilatation only several months later.

Conclusions: Based on our own experience, we believe that laparoscopic Heller myotomy with anterior partial fundoplication is safe and achieves a good outcome in the treatment of achalasia. It is well tolerated and can be considered a true day-case procedure.

Introduction

ESOPHAGEAL ACHALASIA is a rare motility disorder of the esophagus, affecting 1 in 100,000 individuals. It is a benign condition resulting from a loss of ganglion cells in the myenteric plexus controlling the relaxation of the tonically contracted lower esophageal sphincter (LES), although the precise etiology is unknown. Patients present at any age, from childhood to old age, with dysphagia, regurgitation of old food, and occasionally, with chest pain. The diagnosis is confirmed by a combination of barium studies, manometry, and videoendoscopy. Manometry is the most reliable diagnostic tool showing a hypertensive nonrelaxing LES. Aperistalsis or vigorous, uncoordinated contractions of the esophageal body are the associated manometric findings.

The treatment for achalasia involves reducing LES pressure to improve esophageal emptying. The various techniques can be grouped into three approaches: 1) pharmacologic manipulation of the LES; 2) dilatation or stretching of the LES; and 3) surgical disruption of the LES.

Heller first described cardiomyotomy for the treatment of achalasia in 1914,¹ using an abdominal approach with an anterior and posterior esophageal myotomy. This approach was modified to a single myotomy by the Dutch surgeon, Zaaier, in 1923.² Laparoscopic cardiomyotomy was first reported in 1991 by Shimi et al.³ The laparoscopic approach to myotomy is the preferred surgical approach today, as it reduces pain, scarring, and is associated with a shorter hospital stay. All case series have reported a minimum length of stay of more than 1 day. “True” day-case laparoscopic Heller

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This work was presented at the Meeting of the Association of Laparoscopic Surgeons of Great Britain and Ireland, Newcastle, United Kingdom, November 22–23, 2007, and at the Meeting of the European Association of Endoscopic Surgery, Stockholm, Sweden, June 11–14, 2008.

myotomy (i.e., without an overnight admission) has not been reported in the world literature, so far. The aim of this study was to review our results with laparoscopic Heller myotomy and anterior partial fundoplication for achalasia, especially with respect to the length of stay following the procedure.

Materials and Methods

All patients undergoing laparoscopic Heller myotomy with anterior partial fundoplication between August 2000 and July 2007 were included in the study. Preoperative work-up included a barium swallow study or upper gastrointestinal endoscopy or both, along with esophageal manometry to confirm the diagnosis of achalasia. Before presentation to us, 9 (37.5%) patients had previous nonoperative treatment. They included 8 patients who had undergone pneumatic dilatation and 1 patient who had a botulinum toxin (Botox) injection. One patient had previously been treated with a calcium-channel antagonist (nifedipine) as well. None of our patients had prior myotomy. A printed information leaflet was given to all patients in the outpatient clinic following an explanation of the procedure and the potential complications. All patients were seen at a preassessment clinic 1–2 weeks before surgery.

All procedures were performed by a single consultant or a senior trainee supervised by the consultant. The surgical procedure was laparoscopic Heller myotomy with anterior partial fundoplication in all patients, using a five-port technique. The phreno-esophageal ligament was divided, exposing the anterior esophagus and cardia. The esophageal fat pad was then excised. Laparoscopic Heller myotomy was performed by incising the distal 6 cm of distal esophageal musculature, using cautery scissors or, more recently, by ultrasonic scalpel extended 2 cm below the gastroesophageal junction, using hook cautery. Longitudinal and circular muscle fibres were carefully divided until the submucosal plane was adequately identified. All patients underwent anterior partial fundoplication by rolling the fundus over the exposed mucosa to complete the procedure. Three interrupted sutures were placed between the fundus of the stomach and the cut edge of the muscularis to the left of the esophagus, and then three sutures were placed back down the cut muscularis on the right side of the esophagus. Intraoperative endoscopy was not performed as part of the procedure. All port sites were injected with 0.5% bupivacaine local anaesthetic toward the end of the procedure. All patients received a single dose of prophylactic antibiotics at anesthetic induction and wore antithromboembolism stockings.

For the patients who underwent the operation as a day-case procedure, the inclusion criteria were American Society of Anesthesiologist (ASA) grade I–II and adequate home support, defined as the presence of a responsible adult carer for the first 24 hour after the operation. They were admitted to a dedicated adult day surgery unit at 8 AM on the day of surgery. Before discharge, patients were reviewed by the surgeon and were allowed home once ambulant and with control of postoperative nausea and pain.

On discharge, patients were given a standard package of analgesics, consisting of paracetamol (1 g 4 times daily), diclofenac (50 mg 3 times daily), and codeine phosphate (30–60 mg 4 times daily), for 5 days. Arrangements were made for a nurse from the day-surgery unit to contact the day-surgery

patients by telephone on the following day to check on their progress. All patients were reviewed in the outpatient clinic at a median of 6 weeks after surgery and, thereafter, if necessary.

Results

Over the 7-year period, 24 consecutive patients with achalasia were treated with laparoscopic Heller myotomy and anterior partial fundoplication. The patients (13 women and 11 men) ranged in age from 12 to 73 years (median, 42). Intraoperative complications included mucosal perforation in 2 patients, which were recognized and repaired immediately with no leak on the postoperative water-soluble contrast swallow on the next day. No additional procedures were performed. There were no conversions to an open operation. There were no postoperative complications, and no perioperative deaths occurred.

The average length of postoperative stay was 1.9 days (range, 0–4). The last 2 patients were discharged on the same day, and the 5 previous to this were discharged within 23 hours of surgery. There were no adverse outcomes related to early discharge, and there were no readmissions. Both the day-surgery patients expressed complete satisfaction with day-care treatment. All patients reported good to excellent results with relief of dysphagia on follow-up at a median of 6-weeks. Three patients (12%) developed recurrent dysphagia after an initial improvement, requiring dilatations only. One patient (4.2%) complained of acid reflux postoperatively, requiring a proton pump inhibitor.

Discussion

The management of choice for achalasia remains controversial. Multiple treatments exist, including pneumatic dilatation, Botox injection, or surgical myotomy. Because of the rarity of achalasia, there is a paucity of randomized, controlled trials comparing the different treatments with most available data derived from relatively small case series from specialist centers. Historically, dilatation has been the most popular method to treat achalasia. This involves pneumatic dilatation with a balloon to disrupt the circular muscle fibers of the LES, rendering it incompetent. After balloon dilatation, good symptomatic relief has been reported for 76–96% of patients in large case series,^{4–7} especially with repeated treatments.^{5–8,11,12} However, it is associated with a 2–7% perforation rate and a death rate of 1–2%.^{8,9} Laparoscopic myotomy, in our series, has not been associated with any postoperative complications or deaths. More recently, the Botox injection has been used endoscopically to inhibit the release of acetylcholine from the presynaptic nerve endings leading to paralysis of the LES. However, the technique has now largely been abandoned due to poor long-term results, when compared to balloon dilatation.^{10–12}

Surgical myotomy divides the sphincter muscle and has long been a treatment option for achalasia. Two series have confirmed equivalent efficacy and safety of the laparoscopic approach, when compared with those of open Heller myotomy.^{13,14} The laparoscopic approach to myotomy is the preferred surgical approach today, as it reduces pain, scarring, and is associated with a shorter hospital stay. However, as with most advanced laparoscopic procedures, a substantial learning curve is associated with laparoscopic Heller

myotomy to prevent intraoperative complications or conversion to an open procedure.¹⁵ With experience, we find that there is no need to mobilize the entire esophagus and disrupt all of the posterior and lateral attachments of the esophagus and cardia: Only the anterior phrenoesophageal fat pad needs to be incised to expose the anterior esophagus to perform an adequate myotomy. We have observed that adequate extension of the myotomy onto the gastric cardia is important in terms of the relief of dysphagia.

Pneumatic dilatation has been identified as a specific risk factor for complication with laparoscopic Heller myotomy.^{16–18} Some researchers have reported similar problems following Botox injections.¹⁸ We have noticed that the gastroesophageal junction is much more scarred in patients who have been dilated or treated with Botox, resulting in a much more difficult dissection in the submuscular plane over the mucosa. In our series, one of the two perforations occurred in a patient who had undergone pneumatic dilatation. However, 8 other patients who had a previous pneumatic dilatation or Botox injection developed no intra- or postoperative complications. We do not believe that previous pneumatic dilatation carries a necessarily increased risk of mucosal perforation at the time of Heller myotomy, but the dissection is more tedious with poor tissue-plane delineation. This observation has been described by others.^{15,19} A recently published long-term prospective study that specifically investigated the effect of myotomy in patients whose symptoms had failed to respond to repeated pneumatic dilatations concluded that previous dilatation affected neither the surgical technique nor the outcome.²⁰

Only 2 patients in our series underwent a water-soluble contrast study the morning after the procedure. Both had a mucosal perforation that was recognized and repaired intraoperatively with no leak on the study. We do not routinely perform a contrast study on the next day after the operation. However, we believe that a low threshold should be kept for performing a water-soluble contrast study, if the patient exhibits an unusual amount of postoperative pain, tachycardia, or fever.

There is now very good evidence from two randomized, clinical trials of cardiomyotomy with and without fundoplication that the addition of fundoplication reduces pathologic reflux by 13–38% without any interference in postoperative subjective or objective dysphagia outcome.^{21,22} We routinely perform anterior partial fundoplication as the antireflux procedure to a Heller myotomy for achalasia. The advantages of the anterior fundoplication are that it does not angulate the distal esophagus like the Toupet, and it does not require the extensive dissection at the gastroesophageal junction, as described before. This minimal dissection preserves the angle of His and may help minimize postoperative reflux.²³ In our series, only 1 (4%) patient complained of postoperative acid reflux requiring medical treatment. In addition, there is a mechanical benefit gained by the gastric serosa supporting the exposed esophageal mucosa at the myotomy site.

The most important outcome for the patient with achalasia is relief of dysphagia. Twenty-one of our patients (88%) reported good to excellent results with relief of dysphagia on follow-up, with no recurrence in our series. In our series, the last 7 patients were discharged safely within 23 hours of surgery, with the last 2 on the same day as a true day-case procedure. There were no adverse outcomes related to early

discharge, and there were no readmissions. All case series in the world literature have reported a minimum length of hospital stay of more than 1 day, with none thus far reporting a true day-case laparoscopic Heller myotomy.

Conclusions

Based on our own experience, we believe that laparoscopic Heller myotomy with anterior partial fundoplication is safe and achieves a good outcome in the treatment of achalasia. With the exception of the very frail and infirm patient, in our unit, laparoscopic Heller myotomy is now considered the first-line therapy in the treatment of achalasia. It is well tolerated and can be considered a true day-case procedure.

Disclosure Statement

No competing financial interests exist.

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